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TRENTON DELAWARE FALLS COMPANY.

Report of the Board of Managers of the Trenton Delaware Falls Company, to the Stockholders, August 6, A. D. 1832.

The Board of Managers of the Trenton Delaware Falls Company, aware of the deep interest felt by the public in the region where their work is located, as well as by the stockholders, in the situation, progress, and prospects of the company's enterprize, and having been prevented at the last annual meeting, by circumstances beyond their control, from presenting as full and satisfactory a report as they could have wished, take occasion now, to lay before the stockholders, and those otherwise interested, the following detail of their operations, accompanied by some remarks which may be useful, in relation to the powers and organization of the company, the location and advantages of the work, and the prospects of its completion and value: And

I. The Trenton Delaware Falls Company was incorporated by an act of the legislature of the state of New Jersey, passed the 16th of February, 1831, with power and authority to purchase, receive in donation, possess and enjoy, retain, demise, grant, lease, alien and sell, all such lands, mills, manufactories, erections, hereditaments and water privileges, rights, goods, chattels and effects, as should be useful and necessary; to erect a wing dam in the Delaware river, between the mouth of the Assanpink, and the head of Well's Falls, and a raceway in, along, and near the bank of the said river in the neighborhood of Trenton, which they are authorized to extend to any point not exceeding one and a half miles below the Trenton Falls; to cut and erect as many lateral or branch raceways, locks, weirs, gates, and other works, from the main raceway to the river, as may be deemed by the company to be expedient for the purpose of creating and using water power for mills, manufacturing and other purposes; to dispose of, grant and sell all such portions, lots, sites and privileges acquired by them under the charter, and to convey, demise, lease and let the same, for such term or time, and upon such conditions as the company shall think proper and expedient; together with the general power of taking lands necessary for their purposes, at the appraisement of commissioners, and the incidental powers of other corporations.

The charter is perpetual; the legislature is prohibited from levying at any time on the company, any tax exceeding the half of one per cent. on the actual amount of its capital expended in the construction of the work. The capital stock is fixed at sixty thousand dollars, with the privilege of extending it at any time, to two hundred thousand dollars. The shares at fifty dollars each; and in all elections of managers, each share is entitled to a vote.

The legislature under the charter reserved to the state the right to subscribe to one fourth of the capital stock of the company, provided it should elect to do so within two years after the company should have fixed upon and agreed to the size, dimensions and route or location of the said main raceway; the election to be made by the legislature. This right, if not exercised, will expire after the next session of that body.

The managers appointed by the charter to organize the company, opened the books for the subscription in Trenton, on the second day of May, 1831, for $45,000, being three-fourths of the $60,000 capital, reserving one fourth for the state; a large excess of stock was subscribed, which was apportioned by the commissioners among 221 individuals, upon principles considered the most proper and equitable. The route was surveyed, the location fixed, and under the direction of Messrs. Benjamin Wright, Charles Potts, and Stephen H. Long, three competent engineers, the preliminary steps were taken. The maps and surveys were immediately thereafter made and filed, and the land upon the whole line, from the head of Scudder's Falls to the proposed termination of the work, about a mile below the Trenton Falls, acquired, in most cases, by agreement with the land holders. That part of the line extending from the head of Scudder's Falls to the Assanpink being the most difficult and expensive part of the work, was put out under contracts, and in the fall of last year, the excavations were commenced on several portions of the work.

In January last, an order having been made for an additional subscription of $45,000, the books were again opened, and the whole additional stock subscribed for immediately by the then stockholders, to whom the privilege had been extended of doubling their stock. At the close of this subscription, the stock amounting now to 1800 shares, at $50 a share, was held by 116 individuals. The company as at present organized, consists of a president who receives a salary of fifty dollars per annum; a vice president who receives no salary; a secretary who receives a salary of fifty dollars per annum, a treasurer who receives a salary of one hundred dollars; an executive committee consisting of two members of the board, at a salary of one hundred dollars per annum each, and the engineer, who receives a salary of twelve hundred dollars a year—making an amount of $1600 per annum.

Early in the present year, one of the landholders whose land had been taken by the appraisement according to the provisions of the act of incorporation, entertaining doubts as to the constitutionality of the company's charter—filed a bill in the court of chancery for an injunction to restrain the company and their workmen from prosecuting the work upon his premises. The principal grounds taken were, 1. That the lands of individuals, could not, under the constitution of N. Jersey, be taken even for public use; unless the damages were assessed by a jury of twelve men—and in the second place, that this was a private corporation, that these lands were therefore taken for private use, and the law authorizing the appropriation was consequently void. The company took issue upon all the points raised—the case was argued at April term, by distinguished counsel on both sides, and at the late term of July, the chancellor delivered an elaborate opinion, in which upon a discussion of all the points, he fully and completely sustained the constitutionality of the charter, denied the injunction sought, and directed that the complainant's bill be dismissed with costs. An injunction granted by a master, in vacation, to stay the proceedings of the company on another small portion of the work, was dissolved at the close of the same term by the chancellor, after argument on both sides—and the questions which involved the validity of the charter having been thus settled, an end was put to litigation—and the com-

pany are entirely relieved from all legal doubts and difficulties in regard to their corporate rights—and are thus guaranteed in the undisturbed prosecution and enjoyment of the work.

With this brief sketch of the provisions of the charter of the company—its organization—and incipient proceedings—we proceed to,

II. A few remarks in reference to the location and advantages of the company's work.

TRENTON is situated at the head of tide water on the Delaware—is the capital of the state—with a population, including the adjacent villages, of between six and seven thousand. It is distant 30 miles from Philadelphia, and about 60 miles from New York. There are already ten mills and factories in the city and vicinity, supplied with power from the Delaware river and Assanpink creek. The city and neighborhood has always been deemed one of the most healthy in the country.

The assumption is believed to be by no means unwarrantable or extravagant, that in regard to its local advantages as a manufacturing site it is unsurpassed, if at all equalled, by any other in the country. We speak now in reference to the natural advantages possessed, in connection with those to be derived from the other public improvements in progress in New Jersey. And 1st. It is situated in the midst of a rich agricultural country, producing a large surplus quantity of grain of every description, and capable of quadrupling its productions of every kind. The country, to a great extent on every side, is generally composed of fine land, producing or capable of yielding an immense amount of every species of agricultural productions beyond the home demand—and from the produce of the regions whose natural depot is at Trenton, means would unquestionably be derived for the supply of many merchant and saw mills. 2d. It is upon a river navigable for a distance of about 250 miles above the falls—passing through a well settled country—rich in agricultural wealth, abounding especially in lumber, grain, &c. large quantities of which pass now to Philadelphia or New York, at an expense which operates as a tax of nearly an average of 25 per cent. upon its value. The whole of which will, when the canals are completed, and the company's works are established, find Trenton the nearest and most advantageous market. 3d. But the advantages of this location are greatly increased by the improvements now in progress. The feeder of the Delaware and Raritan canal passes up the river a distance of 20 miles, is 40 feet wide by 6 feet deep, and connects with the canal in the heart of the city plot, while the canal itself, connecting with the Delaware below the bars at Bordentown, and along the Millstone and Raritan to New Brunswick, will afford one of the finest sloop navigations, and all the facilities for cheap and rapid transportation by water from and to Philadelphia and New York. 4th. In addition to all these advantages may be added the Pennsylvania canal on the opposite shore, within sight of the company's works, passing along the Delaware to Easton—and the improvements about to be made in the direct land route to Philadelphia. All these combined advantages, we repeat, render Trenton, the seat of the company's water power, unsurpassed, at least in point of facilities for business, by any other location in the country.

III. It is proposed in the third place, to present a brief view of the extent, plan, progress, cost and power of the work, and of the value of that power: And

1. *Its extent*—The main raceway commences at the head of Scudder's Falls, directly opposite the upper end of Slack's Island, and from thence continues down the bank or margin of the river Delaware, until in reaches a point opposite the centre of White's Island, where it leaves the river bank and enters upon the meadows bordering on the river, through which it passes to the Assanpink creek in Trenton. Crossing the creek about 130 feet west of Warren street, by an aqueduct, it passes through Bloomsbury, an adjacent village, in a line, at first, parallel to the main street, and between that street and the river; it then curves to the eastward, passes near the tannery, and pursues a southward course along the low lands on the west of the Lamberton road, and nearly parallel to it, until it reaches the precincts of Lamberton where it makes its debouche into the river. The whole distance, by the route of the raceway, from the commencement at Scudder's Falls to the Assanpink, is 5 miles and 62 chains, or nearly two-thirds of a mile; and from the Assanpink to the termination of the raceway in the Delaware, is 81 chains, or a little more than a mile; making an entire distance of something less than six miles and three quarters of a mile.

2. *Plan of construction*—The fall in the river between the head and foot of the race is about 20 feet. The width of the raceway, on the bottom, is in no place less than 42 feet, and calculated at present, for six feet depth of water. The banks are, however, constructed nine feet higher than the bottom of the race, so as to be capable of receiving a column of water eight feet in depth. The slopes of the banks are as 3:2, or for every 18 inches base they rise one foot. The width of the top water line, for six feet water, is 60 feet; and for eight feet water, 66 feet. The wing dam at the head of the work will be formed of the largest and heaviest stones that can be procured upon the section, of which there is an abundance; these stones will be arranged according to their size and weight, the largest being put on the lower side of the dam, the middle sized next in order, the smallest on the upper side, and lastly, a layer of gravel. As the dam approaches the channel of the river, the heavier stone will be arranged to give the termination the usual form of an ice breaker. The channel of the river where this dam well be located, closes pretty well in with the Jersey shore; the dam thereof will be short; the object of its construction being to make a finish and protection to the contiguous embankment, and to draw into the channel of the raceway, a full and copious supply of water.

From this dam, the embankment extends down in the bed of the river, through Scudder's Falls and is formed upon the following plan. As nearly one half of the excavation on this section of the work, is below the ordinary low water mark, and the descent in the falls being nearly six feet, a coffer dam has been constructed, which commences at the bluff bank of the river, a short distance above the contemplated mouth of the raceway, and extending 150 feet into the river, bends and passes down the stream directly in the middle of the space allotted for the embankment. This coffer dam is formed of three inch hemlock plank, spoked and pinned together in pairs, and laid up in cribs, each crib being about 16 feet long, 7½ wide, and from four to five feet high; these cribs, so laid as to lap into each other at the ends, and filled with fine earth, and puddled, form the coffer dam, and when the work is finished, will form the middle part of the embankment. This coffer dam has a two-fold effect, first, gives strength and solidity to the embankment, and secondly, by excluding the water of the river from the work, enables the contractors to carry on the excavation free from water.

On both sides of the coffer dam, is laid the finer kind of material excavated from this part of the raceway; immediately over this the coarser kind is deposited. The small stones and slate rock, of which there is an abundance, excavated from the upper end of the section, are laid along the embankment extending from the outer bank slopes 10 feet into the river, forming a flooring or apron, of that breadth, and raised to low water mark. On this apron, the wall is intended to rest. Between the top water line and this apron the wall will be three feet thick, with a face sloping at an angle of 33½ degrees to the horizon, or for every foot rise, it will have eighteen inches base. From the top water line, the wall is made in arch form, two feet thick, and rises three feet in nine, and a half feet horizontal. The radius of curvature for the arch is 16½ feet, and the chord of the arch 10 feet nearly. The arch wall terminates at the top or crown, with a long and deep stone set firm into the embankment,

which forms a curb along the top of the arch, and through the middle of the top of the embankment. The inner slope of the embankment will be covered with a coat of gravel or slate rock two feet in thickness. The profile of the inner slope is in every respect similar to that above described. The plan upon which the embankment on the sections below are erecting, is the same, except that there is no coffer dam incorporated with the work. The general base of the embankment on the four upper sections will be 40 feet; the average height of the bank on the first section will be 7½ feet, and on the second, third, and fourth, 10 feet, on the fifth and sixth sections the base and height of the embankment gradually increases from that of section four, until below Gould's Falls, where the basement becomes 50 feet wide, and the height of the bank 14 feet.

On sections one and two, and five and six, the materials afforded by the excavation are the best that could be desired for the construction of the embankments. The top strata of the river bank being chiefly sandy loam, and the lower stratum gravel. On the 3d and 4th sections, the soil is sandy with very little gravel. As a substitute for gravel on these sections, the strippings from the stone quarries in the neighborhood have been used, and are found to answer the purpose remarkably well. The stone employed in the construction of the wall is of the kind denominated free or sand stone. This kind of stone has always been employed with success for works that are to be exposed to the air and water—it is known to resist the effects of water and frost, and is not injured by the exposure to the air. The stone excavated from the upper section is, much of it, unfit for walling, and only such of it as is of the proper kind is used.

The plan of the embankment as above described and adopted, was devised by Judge Wright, and possesses all the features requisite for a cheap, safe, solid and permanent river embankment. The wall on the outside, and over the top, protects it from injury from floods and ice—the gravel on the inner side prevents the velocity of the current in the raceway from washing it away—the fine earth deposited in the middle of the embankment renders it impervious to the water. The floods of the river may swell up and inundate this embankment with impunity; the ice may strike the wall at the foot or at the crown, and it will be found equally and easily to resist both. Walls built upon this plan are much better adapted to resist the effects of floods and ice, than the ordinary river wall, unless raised considerably above the reach of the highest freshets. The danger of a common slope or vertical wall to be carried away with the ice, is in proportion to the approximation of the height of floods and ice to the top or coping of the wall; for, the nearer the action of the ice is to the top of the wall the less weight has the wall to resist it. But when the top of the wall terminates with an arch, a contrary effect must follow—the nearer the point of collision is to the top of the wall, the less will be its tendency to disturb it.

During the time of high freshets, the velocity of the current in the river is considerably increased. By observations made at the time of the highest freshet last season, the velocity varied from three to eight miles an hour—the greatest velocity being at the head of the work through Scudder's Falls, and the least, opposite the four mile ferry. As this freshet was above the top of the embankment proposed on the two upper sections, and as other freshets may be again expected of a similar height, it is proposed, in order to guard against the effects of too great a velocity of water on the material of which the inner slopes of the raceway is composed, as well as in case of breaches, to construct stop or safety gates, whereby the velocity may be checked without impeding the regular supply of water below.

In the remaining part of the work, as far as the excavations have advanced, to wit, on the 7th, 8th, 9th, 10th, and 11th sections, the soil disclosed bears the character that gives permanency to works of this kind, being chiefly clay, loam, and gravel, with a very small quantity of loose sand.

Nine farm bridges and three road bridges will be required. The plan proposed for those on the river sections is, to elevate them considerably above the reach of freshets and ice, by a walled embankment, which will give them entire permanency of character. Three stop gates are to be erected, one on section 2, just below the mouth of Scudder's run, one under the bridge at the four mile ferry, and the third at the entrance of the deep cut on section 6. Immediately in the vicinity of the raceway along the river, and at from 1 to 2000 feet from the line, there is a range of stone quarries, furnishing all the stone requisite for the work, beyond that which is obtained in the line itself.

3. *Progress of the work.*—The raceway from the commencement to the Assanpink, was put under contracts last fall and winter; but active operations were not generally commenced until early in the spring. Up to the first of July last the following progress had been made.

Sec. 1. About 4000 cubic yards of earth, gravel, and rock excavation had been accomplished; the coffer dam nearly finished, and a part of the apron formed, at an expense of $1,622 67.

Sec. 2. Being in the hands of the same contractors had but just been reached; the work is now progressing.

Sec. 3. Nearly 400 cubic yards of excavation had been made; 239 cubic yards of wall laid, and a part of the apron; expense $540 74.

Sec. 4. Upwards of 9000 cubic yards of earth and gravel excavation was completed; as was 882 cubic yards of wall, and a considerable portion of the apron. Expenditure $1,867 07.

Sec. 5. Upwards of 3000 cubic yards of embankment was formed, 245 cubic yards of wall, and part of the apron; expenditure $454 19.

Sec. 6. More than 15,000 cubic yards of excavation had been effected, at an expense of $1,847 61.

Sec. 7. The amount of excavation finished was 20,278 cubic yards, at a cost of $2,025 26.

Sec. 8. There had been 10,485 cubic yards of earth excavated, which had cost $838 79.

Sec. 9. Amount of excavation, 24,949 cubic yards; which together with grubbing and fencing, cost $2,015 64.

Sec. 10. There had been on this section, 14,882 cubic yards of excavation and embankment, part of which was rock, at an expense of $2160 81.

Sec. 11. Amount of earth, gravel, and rock excavation and embankment completed, 33,956 cubic yards. 1,431 cubic yards of wall laid, which with clearing and grubbing, cost $3,682 50.

Making a total expenditure in the prosecution of the work, exclusive of lands and contingent expenses, of $17,055 28, upon the line.

The following tabular statement will show how far the company had approximated to a completion of the work on the 1st of July last. The first column exhibits a view of the amount required under the contracts to complete the work, the second column shows the portion actually completed, and paid for, including the per centage or drawback; and the third column shows the amount of expenditure yet required to complete it.

Sections.	Estimated cost per contract.	Paid for work done.	Expenses necessary to complete it.
No. 1.	$9,550 81	$1,622 67	$7,928 14
No. 2.	6,361 88		6,361 88
No. 3.	10,535 40	540 74	9,994 66
No. 4.	9,261 50	1,867 07	7,394 43
No. 5,	4,973 00	454 19	4,518 81
No. 6.	7,225 83	1,847 61	5,378 22
No. 7.	5,313 20	2,025 26	3,287 94
No. 8.	2,620 00	838 79	1,781 21
No. 9.	2,920 00	2,015 64	904 36
No. 10.	3,202 25	2,160 81	1,041 44
No. 11.	5,201 84	3,682 50	1,519 34
	$67,165 71	$17,055 28	$50,110 43

This, as before mentioned, does not include the work done since the 1st of July; the bills or estimates for which are presented and paid at the present meeting of the Board. These amount to $6,551 62; making on the first of August instant, a total expenditure upon the work (exclusive of payments for lands and contingent expenses) of $23,606 90; and leaving an amount of work yet to be completed, above the Assanpink, which will cost $43,558 81. The present low state of the water in the river being very advantageous for the prosecution of the work, the Board are pressing it forward as fast as possible. The several sections above mentioned are in the hands of eight contractors, who have a force of upwards of 300 men employed upon the line, together with the necessary carts, wagons, stone-boats, scrapers, &c. And before closing this part of their report, the Board would take occasion to observe, that no serious difficulties have been met with on any portion of the work, and that from the progress which has been made, on every part of it, they are sanguine in the opinion that none will be found.

4. *The total cost of the work.* The Board believe they have now all the experience and data necessary to form a correct estimate of the total expenditure requisite finally to complete the work. Every portion of the route has now been sufficiently examined to be thoroughly understood. The estimates have been tested to an extent which renders it no longer problematical as to their accuracy. The land has all been acquired. And although the contingent expenses of a work like this cannot be reached with accuracy, yet they can be so nearly reached as to place the general result beyond a doubt.

The original estimate of the cost of the work made by Judge Wright, including bridges, aqueducts, culverts, and contingencies; and excluding the price of the lands, was, $80,000. This estimate embraced the whole line from the commencement at Scudder's falls to the debouche into the Delaware near Lamberton.

Some variations and improvements which have been made on the original plan, since that estimate was made, have somewhat varied the result.

The first 11 sections, extending from the head of the work to the Assanpink, have been put out and partly finished. These will cost, as stated heretofore, $67,165 71.

To construct the necessary aqueduct across the Assanpink creek, and complete the two remaining sections will cost $4,700.

The total expense of lands, including the whole route, is $17,761 10.

To this add $10,373 19 for contingent expenses, while the work is in progress, which is considered an ample estimate, and we have the result:

Cost of the first 11 sections, - -	$67,165 71
Cost of aqueduct and two lower sections,	4,700 00
Lands, - - - - - - -	17,761 10
Contingent expenses, - - - -	10,373 19
Total expense of the work, - -	$100,000 00

5. *Power which will be furnished—and its value.*

We have already said that the fall in the river between the head and foot of the raceway, is twenty feet. Of this, one foot and a half descent is given to the raceway; leaving a head and fall at the Assanpink of 14 feet, and a head and fall below the foot of the Trenton Falls of 18½ feet.

The entire column of water descending the raceway will be 23,868 cubic feet per minute, at the lowest state of the river ever known. This, at the Assanpink, will afford a water power equal to 435 horses. Or if it is all expended below the Assanpink, it will give a power equal to 575 horses. Or should one-third of the water be used above and two-thirds below the Assanpink, the power above the Assanpink will be equal to 145 horses, that below it, equal to 384 horses. The difference between the power acquired above, and that below the Assanpink, will be understood by every practical man. It requires considerably more water to produce the same effect with a head and fall of 14 feet, than is required with a head and fall of 18 feet and a half. This calculation is based on a depth of six feet water only in the raceway; which is the minimum supply after all deductions have been made for leakage and evaporation, at the lowest water.

This, however, only affords a view of the work in what we shall consider its first stage. The work commences, as has already been mentioned, opposite to the upper end of Slack's Island. This island is situated nearly in the middle of the river, and is of considerable extent. The main channel of the river was formerly on the Pennsylvania side of the island; but the commissioners for improving the navigation of the Delaware, some years ago, with a view to that object, threw across the Pennsylvania channel a loose stone wall, by which the largest portion of the river was forced into the Jersey channel; this wall still remains; it is so low as to be overflowed, however, at the lowest water. By raising this dam, and throwing the whole current of the river into this channel, or by entirely removing it, and erecting a dam from the head of the company's works to Slack's Island, thus re-opening the channel on the other side, the water in the raceway would be raised two feet beyond its present elevation, and in constructing their work the company have adapted it to the reception of that body of water. A column of eight feet instead of six would thus be gained in the race; the effect of which would be to increase the velocity of the current to 122 feet per minute, and the quantity of water to 52,704 cubic feet in the same time. The mechanical effect of which would be equivalent to 960 horse power at the Assanpink; or 1260 below it; or in case one-third of the power should be used above, and two-thirds below the Assanpink, it would afford the company a power above equal to 330 horses, below, equal to 840; in the whole 1170.

In making the calculations which follow, it will be assumed that one-third of the water power will be used above the Assanpink creek, and the remaining two-thirds below the creek, because this will afford a range of a mile and a half along the raceway, for the selection of mill seats, the whole of which distance is composed of lots admirably adapted in every point of view for the purpose; and because the width of the raceway above the creek is such as to enable the company, by erecting abutments upon each bank, and a central pier, to construct, or authorize the construction of, as many mills and factories as they may think proper, directly over the raceway upon their own soil; their charter giving them, as will be seen by looking at its provisions enumerated heretofore, the full power of taking by appraisement whatever lands may be required for the construction of lateral raceways from their works to the river.

It should also be observed in reference to the dam, the benefits of which have been seen above, that the cost of its erection will not exceed $5000; and that its effect would be materially to benefit the river navigation, through Scudder's Falls.

The company will then have, when their work is completed, without the proposed dam, a power equal to 529 horses, or,

If the dam should be erected so as fully to meet the dimensions and capacity of the raceway, the power would be equal to 1170 horses.

The next inquiry is, what is the present value of water power; and as this is an article, bearing, in all equally advantageous situations, about the same price, it may be ascertained by the rate at which it sells at Manayunk, near Philadelphia, and at Lowell, near Boston; to either of which situations, in point of local advantages, the site at Trenton will at least be equal in every respect.

The whole power employed at Manayunk on the Schuylkill, is equivalent to 336 horses. The first disposition of water was made at that establishment, at three dollars a square inch per annum, or $21 for 7

square inches; that power being equal to one horse. But this was when the erection of mills there was considered more or less as an experiment. Subsequently the price has risen to $6 per square inch, or $42 per horse power. The company at Manayunk have now 19 mills and factories located upon their power, yielding a yearly rent of $8,857, and occupying the whole power at present in existence there; the sites having all been taken within a few years.*

At Lowell, on the Merrimack, the water power is disposed of in a different manner. The purchaser is required to pay a certain price, say $20,000 for a mill privilege, and in addition to that an annual sum forever of 260 ounces of silver, or $300 by way of rent charge. The mill powers there are equal to about 56 horses, and the land is conveyed with the power. The river, however, is comparatively small, and every privilege sold is subject to the right of each prior grantee, in case of deficiency of water, and the company only warrant, that *at the time of the sale* there is a sufficiency; if the water afterwards fail, the rent charge ceases, but that is all; the purchaser sustains the loss of his capital himself. The purchasers are bound to construct and for ever keep in repair the flumes and raceways of their mills. The capital required to be paid for a mill privilege at Lowell, we have not been able to ascertain. But power is not, we understand, obtained there on terms more advantageous than at Manayunk.

Lowell is situated at the confluence of the Merrimack and Concord rivers. The water power is produced by a canal nearly two miles in length, sixty-five feet wide, and eight feet deep. The water company have a capital of $800,000. Several extensive manufacturing companies have purchased sites and located themselves there within a few years. Among them is the Merrimack company, with a capital of one and a half millions; the Hamilton company, with a capital of $800,000; the Appleton company, with a capital of $500,000; the Lowell company, with a capital of $600,000; the Middlesex company, with a capital of $500,000; and three new companies have made contracts, and are now erecting their factories, to wit: the Suffolk company, with a capital of $450,000; the Tremont company, with a capital of $500,000; and the Lawrence company, with a capital of $1,200,000. Upwards of 3000 persons are employed by the five first named companies alone. Lowell has but recently sprung out of the desert, and now contains 10,000 inhabitants.†

Assuming then from these fixed and established data, that a power in mechanical effect equal to one horse, is worth $40 per annum, and can readily be disposed of for that sum, and we have these results:

The company's (power without the dam) being equal to 529 horses, will produce per annum $21,160. From which deduct $4,160 per annum for contingent expenses, and a surplus revenue will remain of $17,000, to be divided among the stockholders, or 17 per cent per annum on 100,000.

But by expending an additional $5000 in the erection of the dam proposed, the amount of power, it will be seen, will be equivalent to 1170 horses, which at the same rate, will produce $46,800 per annum; from which deduct for contingent expenses $4,800, and the surplus revenue remaining for distribution among the stockholders will be $42,000 per annum, or 40 per cent per annum, on an investment of 105,000 dollars.

These are the *ultimate* results. Its true that the power thus created cannot be all disposed of at once; this must be a work of time; but when it is recollected that water power, at the rate here estimated, is far more economical than steam, or animal power; that it is becoming scarce; that at all the places where water power has been in existence any length of time, the maximum power has been generally disposed of, and that what remains to be disposed of, is rendered precarious by being subject to numerous prior grants in case of a deficiency of water: and when also the local advantages of this site are considered, it is not believed to be at all chimerical to say, that this enterprize promises not only a very large remuneration to the stockholders ultimately, but a very handsome dividend speedily.

IV. Having thus presented a brief view of the work which has been entrusted to their management by the stockholders, the Board will close this report with a few general remarks. And

1. It is believed the whole work will by next spring be in such a state of forwardness, as to authorize the issuing of proposals for the disposal of mill privileges. That portion of it which lies between the head and the Assanpink, is, by the terms of the contracts, to be finished by the first day of November ensuing; some extension will be required, however, in a few cases, arising out of circumstances not under the control of the company, or the contractors. But the whole of the line to the last mentioned point will be complete early in the spring. The lower portion of the work can be finished in about four months, or less, if necessary; and will be prosecuted as soon as practicable.

2. The amount of capital now actually subscribed is $90,000. The whole amount required will be about $100,000, or $105,000 if the dam heretofore mentioned should be determined on. The right of the state remains, until after the next session of the legislature to take one fourth of the stock, or $30,000. If that right is exercised, there will be a surplus capital which might be expended in erecting mills by the company; and the Board are of opinion that it would be prudent to keep this in view in the disposition of mill rights, at least until the legislature shall make its election. It is suggested, however, that it might be proper respectfully to propose to the legislature to limit the exercise of its reserved right, if it should be disposed to exercise it at all, to the amount of $15,000, the sum actually required.

3. In conclusion—The Board believe they may congratulate the stockholders upon the prospect before them. Every thing connected with the work itself, wears the happiest aspect, and presents the prospect of realizing the most flattering anticipations of its projectors. They conceive also, that the period at which it is coming into existence, is highly favourable to its ultimate success. The principle of extending a sufficient protection to the manufactures of the country, may now be considered as the settled policy of the government; and the more securely so, in consequence of its being placed upon the basis of moderation and compromise. Respectfully submitted.

George Woodruff, Prest.
William Grant, V. Prest.
David Johnston, Sec'ry.
Thomas J. Stryker,
John C. Schenck,
John B. Abbott,
Thomas M. Perrine,
Charles Burroughs,
Stacy A. Paxon,
John M'Kelway,
Samuel R. Hamilton,
Philemon Dickerson,
Stacey G. Potts,
} Managers.

Dated August 6th, 1832.

* Since the above went to press, information was sent from Patterson, N. J. that all the power was sold at 50 dollars per horse power.

† Patterson, in our own state, may also be referred to. There are now in operation at that place, 39 mills and factories, employing 2,543 hands, and paying an annual amount of $387,003 in wages. The power is supplied from the Passaic; and is rented at the rate of from 42 to 50 dollars per annum per horse power, or $500 per annum for a power equal to from 10 to 12 horses. The leases run for 21 years, with the right of renewal upon paying a fine of one year's rent on each renewal. Patterson has grown with astonishing rapidity, and in a few years has become one of the first towns in the state, in point of population and wealth.

I fully concur in the above report, and believe all the matters therein set forth are correct and true.

CHARLES POTTS, Engineer of the Trenton Delaware Falls Company.

Trenton, August 6th, 1832.

INVESTIGATION OF THE EPIDEMIC CHOLERA.

(Continued from page 157.)

IV. *Influence of Locality, Habits of Life, and Disciplinary Regulations.*

In treating of the local causes existing in Montreal to influence disadvantageously the character of the disease, the fact was there stated, that two-thirds of the cases were located along the banks, or in the streets immediately adjacent to the ravine and rivulet which almost bisects the city. The disease in Quebec commenced and was chiefly prevalent for a few days in "the cul-de-sac, a low, confined, ill-ventilated part of the city, crowded with emigrants of the lowest description, with sailors, and other persons of irregular habits." It was this portion of the town that furnished a constant succession of cases.

The island of St. Helens, opposite the lower suburbs of Montreal, displays the influence of locality in a striking manner. The troops were stationed in barracks situated in the Quebec suburb. The disease appeared among them immediately after it broke out in Montreal; they were a few days after transferred to the island, and in three days from their removal not another case took place. The number of cases in the garrison was 94—85 men, 7 women, 2 children—of which 36 died; 34 men, 2 children. The same circumstance was observed in another detachment stationed at the La Prairie barracks. The troops became affected and a number died. They were removed to the island, and the disease immediately ceased.

The island is formed of limestone rock, overlaid with a dry, marly soil—it is shaded with lofty trees, and covered with a fine sward. A small portion is devoted to cultivation. The shore is dry and pebbly—no damp or marshy exhalations contaminate the purity of its atmosphere.

Although the troops were encamped on the island, a guard of twenty-five men was detailed daily, to be stationed at different posts in the town during the day and night, yet none were attacked with the disease. The exemption is to be attributed to the constant surveillance exercised by the medical officers over the health of men, and the impossibility of irregularities. The soldier while on duty, cannot indulge in any excess, and on the island it was not in his power to gratify his vicious propensities.

In this instance it is impossible not to be struck in the most forcible manner, how completely this terrible affection is to be controuled and baffled by attention to the salubrity of a residence and strict disciplinary regulation.

The influence of locality is exemplified in other instances. At Trois Rivieres, midway between Quebec and Montreal, which is a sandy soil and elevated position, and at which the emigrants land in great numbers, the disease has been very light—it is denied that it has occurred except amongst a few emigrant passengers landed from the steamers. At Berthie, higher up the river, which is out of the route of the emigrants, where they do not land, but which lies low, in a damp, wet soil, the disease has prevailed with great violence among the Canadian residents and natives.

Sorel, which is also situated on a dry sandy soil, at the mouth of the Richelieu, has escaped the disease, while it has raged with great violence at Chambly, a few miles above, on the same river, and has appeared at Isle au Pas in the river immediately opposite the town.

Many other villages also escaped a visitation, or the disease manifested itself in the slighter form of disordered stomach and bowels, easily managed, and giving rise to but few cases of its more malignant type.

In these instances particular circumstances mitigate the energy of the productive cause, or tend to modify the character and reigning type of the disease. These circumstances properly seized on and duly appreciated, are of the highest consequence; for though it may not be within the limited power of our very finite capacities to ascertain the natural causes in the action of which pestilential diseases originate, nor in the power of human agency to destroy those causes, yet, by determining the laws of their production, and all their attending phenomena, we may controul their energy, restrict the extent of their prevalence, and abate very largely their mortality.

Habits of life have acquired so much of notoriety from their influence as predisposing and exciting causes of diseases generally, but as more especially marked in the prevailing epidemic in these respects, that it would be supererogation to enlarge on this subject. Still it would not be proper to pass in silence the concurrent testimony furnished to this most important fact, by the experience of Montreal and Quebec. This point, in fact, cannot be too strongly enforced, or too emphatically dwelt on, for it is the circumstance of all others, that most places the disease within the controul of nearly every individual. Few attacks of this affection in its malignant and unmanageable form take place, that are not to be attributed to the habits of life, or to some act of neligence or imprudence on the part of the patient.

Under this head, the habit of life, maintaining an unrivalled supremacy in its pernicious tendency, is intemperance in the use of ardent spirits. It is true that persons who are perfectly temperate in this particular are the subjects of the disease, and even become its victims; but these are rare instances when compared to the numbers of the intemperate who perish from its ravages. In Montreal we were informed that no one addicted to habitual intemperance recovered. The organs that most suffer from the impressions of the morbific cause generating the disease, are placed, by the habits of intemperance, in the very line of the disease. They have already passed the first steps; the opposition raised by a sound constitution to the progress of destruction has already been beaten down—no obstacle is present to impede its onward course—it is a blow, a rush, and the miserable wretch is sunk into the prostrated collapse, a rescue from which is almost a miracle, and is too rarely witnessed.

Intemperance in other respects, whether of a moral or physical nature, though less destructive than the habits of constant intemperance in ardent liquors, are of injurious consequences. They all possess the general effect of disturbing the equilibrium in the force of the various organs composing the animal economy, and in this manner destroy its powers of resisting morbific impressions, and often call into active existence the latent influence exerted by the epidemic poison on the economy, and which would otherwise have passed away.

It has been a very general observation, that the prevalent epidemic has spread its destructive ravages among the lower orders of society, touching with a light and sparing hand those happier individuals blessed with easy circumstances. This general observation, though it has its exceptions, explicable always by some marked peculiarities in the cases, was verified at Quebec and Montreal. The greater number of individuals attacked, and especially those who perished, were of the lowest class of the emigrants, and resident or native population. The most numerous exceptions to the rule occurred during the panic which pervaded the population of both cities for a time. In Montreal, from the existence of so many co-adjuvant causes aggravating the disease, more of the better orders of society perished than in Quebec. In this latter city, of 362 subscribers to the exchange coffee-house, and who are all persons enjoying comfortable and good circumstances, only one died,

and particular circumstances tended to give in that a fatal result.

This greater prevalence of the disease in the lower classes of a population, arises entirely from their habits of life. It is in those classes that gross intemperance abounds, which, united to aliment of inferior quality, small, close, ill-ventilated, crowded, and uncleanly dwellings, form a combination of all the circumstances inviting the attacks of the disease and aggravating its character. In addition to these, in the lower classes, almost without exception, the symptoms of the first stage are misunderstood and neglected, and they are placed under medical treatment only when the disease has assumed its most formidable aspect. It is from these causes, as more frequently existing in the inferior classes, that the poor suffer in greater numbers; but intemperance, imprudence, negligence, and inattention to cleanliness in any situation, among the rich or the poor, the high or the low, are equally predisposing to and excitative of the attacks of the disease. Another prolific cause subjecting the poorer classes in greater numbers to this terrible malady in its worst shape, is the constant necessity of labour for their subsistance. The exhaustion of fatigue especially induced by labour in the midday sun, is amongst the most common sources of the malady. In Montreal, we were informed by Dr. Robinson, "that masons, sawyers, and others exposed in their occupations to the open air suffered greatly. Men fell down with their hods on their shoulders." These facts indicate the propriety, during the prevalence of the epidemic influence, of suspending labour during the hours of greatest heat.

The immense advantage, the almost absolute conservative power affording nearly complete immunity from the disease, derived from disciplinary regulation, was demonstrated by the exemption from the epidemic procured for the garrison of Quebec. The troops were stationed in fine lofty barracks in the upper town, and so far possessed the advantages of a salubrious situation. But detachments were daily posted in different positions both of the upper and lower town as guards—and thus were exposed along with the citizens to the common causes of the disease. No soldier, however, was permitted, when not on guard, to leave the barracks, unless accompanied by a non commissioned officer, responsible for his conduct. Every precaution was taken to preserve the most perfect cleanliness, and to prevent excesses, or exposure to the imprudences of which soldiers are so commonly guilty. Every morning, the garrison, men, women, and children, were mustered and underwent an inspection and examination by the medical officers, so as to detect the first germs of complaint. Not a case of Cholera occurred in the barracks until Monday, June 2d, twenty-four days after the commencement of the epidemic. A sapper and miner of feeble constitution, who lodged in the citadel, was then attacked, and is the only case known to have occurred.

Combining together in a general result the foregoing observations, we obtain the following summary of facts:

1st. The epidemic appeared almost simultaneously at Quebec and Montreal, and in a few days occupied with but few exceptions, the whole line of the St. Lawrence, from below Quebec to Prescott and Ogdensburgh on the river—and York and Kingston on Lake Ontario.

2d. A large body of emigrants had arrived at Quebec and Montreal previous to the breaking out of the disease, but who continued in health.

3d. That the circumstances in which these emigrants were placed, were precisely those that give in the highest degree, the predisposition to the disease, and are the most active of its exciting causes.

4th. That no emigrants had landed at Quebec or Montreal previous to the commencement of the disease, who had arrived in vessels on board of which cases of cholera had occurred during the passage.

5th. That the average duration of the voyages was from fifty to eighty days; while the period of incubation of the disease, or the time from exposure to its cause and the development of its symptoms, so far as ascertained by the history of the disease from its commencement to the present epoch, is from six to fourteen days.

6th. That the Carricks, the only vessel on board of which cases of Cholera had taken place before her arrival at Quebec, was, on the 8th of June, the day when the disease commenced its ravages in that city, actually in quarantine with her crew on board, and her passengers all perfectly exempt from disease, in the shed on Grosse Isle, thirty miles below the town.

7th. That the disease attacked on the same day, the emigrants and French Canadians, and singled out victims at points distant from each other, and who had no previous communication.

8th. That in Montreal, the English residents did not begin to suffer from the disease, until the 17th of June, a week from the time it first appeared.

9th. That in Montreal the Canadian population suffered more than the emigrant population, especially when it is taken into consideration, the unfavourable circumstances in which these latter were placed.

10th. That the native Indian population appeared to be strongly predisposed to the disease, which afflicted them with a dreadful mortality.

11th. That numerous causes existing in Quebec, and more particularly Montreal, concurred to occasion the rapid extension and propagation of the disease in those cities, and impressed on it the virulent aspect and malignant character it there manifested.

12th. That those circumstances do not exist in the city of Philadelphia, and with some degree of confidence, we may anticipate a mild visitation, and comparative exemption from its prevalence in the epidemic form; or should it appear, that it will be confined to the close lanes, alleys, and narrow streets, with crowded tenements, where ventilation and cleanliness cannot be procured.

13th. That a system of municipal regulations calculated for the preservation of the community, and a sanitary police perseveringly adhered to and rigidly enforced, are capable of guarding, to a great extent, against pestilential influences, and warding from the people the attacks of the epidemic, in the form when alone it is malignant and unmanageable.

14th. That individuals, by an adherence to a strict personal morality, by temperance in all the appetites, and moderation in all the passions; by cleanliness, and the exercise of a common prudence, may preserve themselves amidst the pestilence, perfectly exempted from a malignant attack, which is alone to be apprehended. The disease is thus placed in a great measure under individual control.

15th. That instruction in this important, and we believe universal fact, should be carried home to every individual of the community. This may be accomplished by a few simple rules and precepts, concisely and clearly expressed, published and largely distributed, placarded on the corners of the streets, alleys, and lanes; affixed to places of public resort; placed in a conspicuous position in all the taverns and boarding houses of the city; taught in the public and private schools as a portion of the public exercises; and above all, enlarged upon and enforced by the moral instructors and spiritual guides of the people, with all the eloquence and talent that adorn, and the holy reverence that surround the sacred desk.

Part 2d. Medical Account of the Disease.

General Remarks.

I. So much has been written and published within the last two years on malignant cholera, under various designations, that it might be thought prudent and excusable, should we omit entirely to enter on any medical notice of the disease. The press has literally groaned beneath the weight of publication. Notwithstanding

these numerous efforts, and this amount of labour, it must be confessed, that a corresponding progress in arriving at positive knowledge of the character, nature, and method of treating the disease, has not been accomplished. The evidence of this is presented in the discrepancies of opinion, and the discordancies of views that are earnestly maintained; the conflicting theories, the opposing numberless systems of treatment, all equally conjectural, uncertain, vacillating, vague, and unsatisfactory in results, that are daily promulgated and warmly advocated. Truth is simple, striking, and convincing. When once discovered, then rally around it unprejudiced inquirers, the candid in sentiment, the true lovers of knowledge, and a unanimity of opinion soon begins to prevail; for facts presented in their just light are seen alike and acknowledged by all. Diversities of opinion on the same subject are generally proofs of obscurity and ignorance, and numerous remedies for the same evil are conclusive evidence of the little utility of any. In this unsettled state of the question, we may be permitted, without hazarding the charge of presumption, to offer the results of our observation on this formidable epidemic.

Before proceeding to speak of the disease, a few general observations on epidemic diseases will tend to illustrate some of its characters.

A. *Epidemic Influence or Constitution.*

The influence or remote cause giving rise to epidemic diseases is unknown. All that has been written on the subject is mere conjecture, and deserving no serious attention. It is probable certain information on this subject is not attainable, from the imperfection of our means of research, and the finite power of our senses. Though we may not penetrate the nature of final causes, yet we can seize on the phenomena they develope, we can determine by cautious observation the modes in which these are produced; we are enabled to appreciate their true character, and to unfold the laws by which they are governed. This is the only knowledge man can boast of as positive: it is that which he can alone render available for useful purposes in his present mode of existence.

Epidemic diseases are to be studied on these principles. In a philosophical view they compose great problems, the solution of which will furnish the basis of sanitary municipal regulations for the community, and fortify the moral discipline of society. In this light they are to be regarded as important lessons to be studied as yielding wholesome instruction, and not in the light of vengeful acts to be deprecated, as inflictions for offences with which they are unconnected.

Some general principles in relation to epidemics may be considered as well settled.

1. They are partial, as pervading a city, district of country, or an entire continent; or universal, as sweeping over in succession, a zone of the earth.

2. The grand line of march of universal epidemics, is from the eastward to the westward, though they exhibit at the same time, an irregular and sometimes a diverging course.

3. They are confined to zones comprehending a certain number of degrees of latitude. The influenza of last winter did not reach as far north as Montreal, and it does not prevail at the same period, in both hemispheres. The dengue which travelled as an epidemic the circuit of the globe a few years past, was limited to the southern latitudes of the northern hemisphere. As yet the most southern point of the present epidemic has been the Mauritius.

4. The duration of the epidemic influence or constitution varies, being prolonged from a few months to several years. The influenza seldom continues longer than three or four months in any one place; it travels rapidly, and generally completes the circuit of the globe in about twelve months. The eruptive diseases when epidemic, as small-pox, scarlet fever, and measles, are slower in their movements. Small-pox and measles generally prevail from one to three years; scarlet fever from three to five years, and they occupy from ten to twelve years in their circumterraneous course. The present epidemic has occupied fifteen years in its progress from Bengal to the continent of America.

An epidemic constitution that gave rise to yellow fever, high bilious remittent, and intermittent fevers, commenced about 1790, in the United States, and continued to 1805. During this period, every summer, cases of yellow fever occurred, and it was at times epidemic. This constitution disappeared until 1819, when it again returned, acquired its acme in 1825, and has since declined.

While the epidemic influence endures, the disease it generates continues to recur at different intervals, until the epidemic constitution is exhausted. It is not improbable, from all appearances, that malignant Cholera may for a time present this character.

5. The epidemic influence is not confined to the human race. All organized beings suffer from its operation. The epidemics of animals, or epizootics, have become an interesting subject of inquiry, and throw much light on epidemic diseases generally. The blights which affect plants very extensively, are epidemics amongst vegetables. The whole of the forest vegetation was remarkably backward in Canada, and exhibited an extreme langour, while an immense number of the trees had perished. It was generally supposed they had been killed by the winter cold. Yet this seems rather doubtful of the hardy forest trees.

6. The epidemic influence or constitution is essential for each particular epidemic. No one epidemic can be taken as a standard by which the others are to be compared, examined, and judged of, but each must be investigated in reference to its own phenomena. The epidemic influence or constitution appears to act on certain organs, and affect certain functions of the economy, disordering or disturbing their natural or physiological phenomena, and altering their natural mode of being, and thus producing an especial predisposition to a certain form or class of diseases, in preference to any other.

7. The epidemic influence or constitution is essential to the prevalence of any disease in the epidemic form; even of diseases notedly contagious. Small-pox, measles, and scarlet fever, are contagious diseases, and at the same time are epidemic or sporadic, according as the epidemic influence may be existing or absent. Before the introduction of the practice of innoculation for small-pox, it prevailed epidemically at intervals of twelve or more years. After innoculation became general, individuals affected with small-pox always existed in society, but the disease did not assume the epidemic character, except at certain epochs. There was something wanted, which was the epidemic influence, imparting the predisposition. Since the abandonment of the practice of innoculation and the substitution of vaccination, small-pox now presents its original character. It disappears for a series of years, or manifests itself only in the sporadic shape. This circumstance from being misunderstood, led to a belief for a time, that vaccination had actually exterminated small-pox. But this pleasing delusion was dissipated by its recurrence, accompanied by its modified congener varioloid, in the epidemic form, when its specified period arrived. This has now become the settled habit of the disease. The same observations are applicable to all the eruptive contagious epidemic febrile diseases.

They are equally true with respect to other febrile epidemics. During the influence that imparts the predisposition to yellow, bilious, and intermittent fevers, putrid effluvia, marsh exhalations, moral commotions of the intelligence, indiscretions in habits of life, and numerous other causes, which, at other periods would be innocuous or cause a slight degree of disorder in some function or organ, now becomes exciting causes, developing those greater maladies. The same facts ap-

plied to other epidemic affections, and particularly to the present reigning disease, which is excited into action by the same causes that before produced former epidemic diseases.

8th. Epidemic influences of constitutions recur periodically at different intervals. Influenza recurs at intervals of six or seven years; small-pox, measles, and scarlet fever, re-appear at periods of from twelve to fifteen years. The various forms of epidemic gastro-enterites, yellow, remittent, bilious intermittent fevers, and the same diseases with typhoid characters, have manifested periods of from fifteen to seventeen years. These periods are stated not as positively accurate, but as approximations to the truth. More time than is at our disposal, and a reference to numerous works would be requisite to establish the exact intervals and periods of each epidemic. The preceding views are the result of the recollections of general reading and observation, and may be liable to some inexactness, though the principle will be found correct.

II. *The Prevailing Epidemic.*

The present reigning epidemic having ravaged Asia, and over-run the great portion of the European continent in its desolating march, has reached our shores and threatens to carry its devastations into every portion of our country.

The generic name of Cholera first given to it in Bengal, has been universally adopted, though a variety of special appellations has been bestowed on it. The term has most probably been unhappy. The disease is certainly very distinct from common cholera morbus, though it presents some features analogous to that affection. It bears, however, analogies quite as strong to other diseases. The name too has led most probably to treatment very generally based upon the usual remedial proceedings adapted to common cholera, but the propriety of which may be well questioned.

Many discordant opinions have been advanced, each of which has been more or less earnestly advocated, respecting the proper character and true nature of this formidable and ever peculiar disease. They may be approached probly more nearly by an analytical exmination of its distinguishing features.

Malignant Cholera, the name that at present may be adopted as the least objectionable, exhibits very distinctly different stadia or periods, each possessing its peculiarities, constituting perfectly distinct, and in some of them dissimilar states, requiring different modes of proceeding in the treatment.

Four or even five periods may be distinguished, and will be the best understood by treating of them separately.

A. *The period of Predisposition originating in the Epidemic Influence or Constitution.*

Every epidemic, it has been seen in our general observations, depends on the agency of some unknown cause, disposing at the same period, numbers of individuals on whom other causes perturbative of the operations of their economy shall exercise their influence, to be seized with a particular array of symptoms or attacks of a disease, in preference to any other set of symptoms or disease. This remote cause is often widely diffusive, acting at once over a wide space. It gradually advances in intensity, reaches its climax, and then as slowly disappears.

In the present epidemic, this character is strikingly displayed. Wherever the disease has prevailed, it was preceded by a disorderly condition of the gastric and intestinal functions, with slightly augmented nervous irritability. And during its continuance, those who escaped the explosion of the disease, all suffered in varying degrees from affections of this nature.

In Montreal, as early as the months of April and May, this epidemic influence was manifested; numerous cases of stomach and intestinal diseases attracted the attention of the medical practitioners. Cholera morbus, though out of season, occasionally occurred, and one fatal case with the symptoms of the disease that subsequently appeared, took place in the Quebec suburb, under the care of Dr. Nelson, on the 28th of May.

Dr. Robinson keeps a meteorological table, in which remarks are made on the prevailing diseases of the north. He exhibited to us the following entry on the 1st day of May last. "In April, near the close, several sudden deaths with collapse and great prostration of vital powers in a remarkably short time from the attack. *If they had occurred where India Cholera prevailed, they would be classed under that head.*"

At St. John's the same facts were noticed. Dr. Buckley lost in April, a patient named Steen, from an attack of the cholera morbus, which exhibited the same characters as the epidemic that afterwards ensued.

In Philadelphia, every one the least observant, has been conscious of an unusual and peculiar condition of his economy, during the last three or four weeks, chiefly displayed in the disordered state of the stomach and bowels. It is probably no exaggeration to assert that two-thirds of our population have experienced feelings of this kind. This derangement of the functions of those viscera, is not confined to our district of country. Letters from medical gentlemen in various sections of the country, as far south as North Carolina, announce the existence of the same phenomena. Of the fact of a general epidemic predisposition, there can exist no manner of doubt. It remains then to inquire first, the symptoms of this state, and second, the condition of organs in which it consists.

1st. *Symptoms of the Epidemic Constitution.*

They are chiefly disturbance in the healthful feeling of the stomach and bowels, and the regular exercise of their offices. Digestion is impaired; food that formerly caused no disorder of these viscera, produce a sense of tumefaction and distention of the stomach and abdomen, or bring on attacks of colics or diarrhœa. A sentiment of heat in the belly is not unusual, and slight dysenteric symptoms are present. The tongue in most persons is furred, and not unfrequently pasty. Thirst is generally more urgent than usual.

This array of symptoms so generally experienced, is clearly indicative that the epidemic cause or influence affects primarily and principally the mucous tissue of the alimentary canal. It would appear to be its starting point.

2d. The condition or mode of being of this tissue as indicated by the symptoms, is that of an extensive irritation, occupying not a single zone of this extended surface, but its whole extent. The phenomena manifested in this period of the disease, have the closest analogy to the phenomena resulting from small doses of an irritating or drastic cathartic; not sufficient to ensure a free and copious evacuation, but tormenting the bowels with their irritating impression, disturbing their offices, and worrying with irregular operations.

The treatment adapted to this period and to these symptoms, is chiefly dietary. While the symptoms are strongly marked, solid food should be omitted. Mutton or chicken broth; rice or barley water; rice or hominy, for a few days should constitute the food. Black tea made by boiling so as to form a strong decoction, possessing slight astringent and tonic properties, diluted with cream or milk, forms the best breakfast and supper. Bread should be stale. At the same time, quiet and rest should be observed. The patient should keep to the house, or remain in bed, and maintain the body in a comfortable temperature, erring as to heat rather than cold.

For medicine a few drops of spirits of camphor, or spirits of camphor with laudanum or black drops (notwithstanding the formal prohibition of this combination) are useful. If there be diarrhœa or pain, the opiate is essential. Calomel or blue pill, with opium and ipecac, in this are also serviceable. The external irritation of the skin by salt or by foot baths, pitch plaisters, spice

plaisters, daily frictions of the body are exceedingly servicable, and these constitute excellent prophylatic means.

Purgative medicine must be avoided entirely in the delicate, feeble, and nervous, and in the robust, strongly constituted and phlegmatic, be used with great discretion and caution. The saline purgatives are particularly obnoxious to this complaint. Many fatal attacks have been developed by them. The bowels are intolerant of purgation.

The symptoms of this state are easily controlled, and hence arise the numerous remedies extolled as specifics in Cholera. The cures have been in cases of this slight nature, apparently augmented, by timidity of character in some, and the nervous temperament of others, exaggerating symptoms, without increasing their danger.

The most certain, the most efficient remedies are diet, rest, repose and warmth.

In a great majority of a population, the epidemic influence proceeds no further in the production of disease, especially in the temperate, and those of good constitution and sound organs. To the explosion of the disease in its aggravated character, an exciting cause is necessary, and this cause may be any circumstance making a strong, powerful and sudden impression on the economy, no matter what may be its nature. Hence it is that all situations where unwholsome and offensive effluvia, exhalations, miasmata, are generated—where malaria exists—errors of diet, passions, strong doses of medicine, and a thousand other circumstances are observed to bring on sudden attacks of the disease.

(*To be continued.*)

From the National Gazette of 1829.

PENITENTIARY DISCIPLINE.

No. II.

To the Legislature of Pennsylvania.

Having discussed at length the propriety of capital infliction, I come now to the subject of penitentiary discipline. This, at the first glance, may seem less important than the former topic; but a very slight reflection will discover its incalculable moment. It is a subject, too, peculiarly interesting to the feelings, the character, and the moral prospects of Pennsylvania. I shall not now dilate upon the effects of erroneous ideas in reference to prison regimen, as this will be admitted in the abstract; but endeavour to demonstrate that false notions prevail at Auburn, the plan which its defenders are so desirous to have transported hither—that it has been as extravagantly praised as it is lamentably defective—that it is unsuited to this meridian—and every way calculated to mislead those whose minds have not been seriously and for a long time turned to the subject. After this I shall submit to a full and rigorous examination, the theory of solitude with labour, denominated *Pennsylvanian*—lay it bare to public scrutiny, and challenge the keenest ingenuity of its adversaries to sustain their objections.

The system pursued at Auburn is not the native growth of New York, but an exotic transplanted from a distant country, and altogether unsuited to the American soil. But the good people of our sister state seem to prefer the introduction of plans derived from others, to striking out a theory for themselves, the fruit of close attention and patient experiments. The truth is, less zeal has been devoted to Penitentiary discipline in New York than in Pennsylvania: they boast no institution similar to our Prison society, whose untiring benevolence has subjected them to the labour of projecting expedients, of proving them, and from time to time of submitting to the public the result of their investigations. Prior to the introduction of her present system, she leaned upon Pennsylvania for support, defended her penitentiary improvements, and adopted, with little examination, what the latter had found to be beneficial. But instead of continuing her adherence, and acquiescing in the wise dictation of our enlightened philanthropists, she grew tired of waiting the slow but sure operations of truth and experience—became captivated with the *Maison de Force* of the Netherlands—and abandoning her former guide,—placed herself under this new instructress. Whatever may be the *comparative* merits of the Ghent Prison, and the other European establishments, is not a question I mean to agitate; indeed I may concede, from the successive testimonies of the illustrious Howard and Buxton, and the Prison Society of London, that it has superior claims to preference. But when we consider the state of crime, and the sanguinary notions of punishments prevalent in Europe on the one hand, and the more humane ideas entertained, as well as acknowledged improvements suggested here on the other, it is not a matter of ineffable surprise that Pennsylvania should disdain an obsequious regard to transatlantic projects; and when it is universally admitted, that the end of retributive justice should be no less to reclaim than to punish the culprit, it is only rational that she should turn her eyes from a scheme whose leading object is declared to be *profit*. The latter is distinctly avowed in the sixth report of the London Society: "Profit being the leading object of the establishment, it has been found more advantageous to confine large numbers together, with a view to the facilities of manufacture, than to subdivide them into classes," &c. But whatever excuse, whether aggrandizement, fickleness, or impatience, may have prompted New York to the adoption of the *Maison de Force*, both that prison and its servile imitator have fallen far short of what is *known* to be the certain destination of the Pennsylvania system. Let the *comparative* merits of the plan be what they may, so long and ardently the themes of indiscriminating panegyric—looking to European penitentiaries as the standards of excellence—its *absolute* demerits and total unfitness, are glaring and palpable. The beauty of the internal economy of Auburn had been so often repeated in our ears, with all the heat of sectarian feeling and uninformed prejudice, that benevolent individuals have thought it worth the trouble of a personal visit; and all who are in any way connected with the Prison Society, or who have given any attention to the characters of men depraved by vicious indulgence, view it as a scheme, accordant perhaps with the notions popular in past times, but by no means creditable to the advanced intelligence and humanity of the present day. Omitting all others, the testimony of the Hon. Edward Livingston, of Louisiana, an able jurist, and intimately conversant with penal philosophy, acquired by study, long intercourse with prisons, and a deep and intense reflection on the evils springing out of present and former errors, is unquivocal, decisive, and strong. His letter to Mr. Roberts Vaux, of Philadelphia, furnishes a host of arguments against the scheme—arguments suggested by a careful inspection of the prison—and some reasons why Pennsylvania cannot, without vacillancy and exposure to ridicule, consent to its adoption.

It is deeply to be deplored, that while Pennsylvania was engaged in her onward march of criminal improvement, attracting to herself the attention of the other states, and even several of the more liberal nations of Europe, who admired the practical philosophy, the calm benevolence, and the enduring patience, with which she proceeded; while every thing was beginning to promise a more refined and philosophical theory of prison discipline, which would confer on the Union distinguished moral benefits, and be received by each state with approbation—that New York, dazzled by a foreign glare—by a dim light emitted from adjacent darkness—should throw difficulties in her way, and by taking a retrograde step herself, obstruct the fondly anticipated consummation.

But it is time distinctly to exhibit what the discipline of Auburn proposes to accomplish. In a word, it is calculated to make money; but it professes to do no more. Its friends all agree that it subdues the spirit, teaches

obedience to the laws, and effects ultimate amendment. But how is this amendment produced; for we can understand without explication, the *manner* it which its lessons of subordination and humility are inculcated? In the same way that the former are taught? It is presumed so; for the only difference between the boasted discipline of Auburn, and that adopted so early as 1794 in Pennsylvania, and now to be altered, and, it is believed, to be improved, consist in severe public castigation, and separate confinement at night. Of the latter I entirely approve, since it is only an approximation to the Pennsylvania theory; but of whipping, to tame the spirit or enforce penitentiary rules, I must express my decided disapprobation and abhorrence. It is odious as an infliction, revolting to human nature as a punishment;—degrading her with the brutes—hardening to the feelings of the sufferer; and extinguishing in him every spark of manly sentiment or personal independence. Whatever reasons may be urged for the propriety and necessity of discreet flagellation in the case of a child, to expiate filial disobedience or maintain scholastic government, they cannot apply to an adult, whose soul is rendered too infuriate by the degradation. Anger the most desperate and lasting, and vengeance the most determined and diabolical, must invariably arise from subjection to such an ignominy. Whether, then, a punishment ordinarily producing these effects can, when inflicted at the option of an arbitrary keeper, or at the mercy of an unrelenting deputy, *on the bare back, by thongs, and in the presence of the assembled prisoners, who witness the disgrace,* be followed by any consequences but the fostering of malignant passions and the most deplorable hardihood, is placed beyond the uncertainty of conjecture. Pennsylvania repealed the power to inflict corporal beating in 1795, though it was before discontinued in practice, as not only subversive of the ultimate end of punishment, but because it was repugnant to the humane principles of her penal policy, and opposed to the genius of her institutions.

But flagellation is not the only bad feature in the Auburn discipline; another and even a stronger objection remains, which is, of joint labor during the day. Association in prisons is destructive of the primary object which legislatures have in view in confining the body, and of a vital principle which they are supposed always to have in contemplation. In the absence of every other reason, it is a positive gratification to the criminals. Men who have preyed upon their species, by abducting or otherwise injuring their property or lives, should be deprived of the enjoyment of social intercourse, which not only takes away the bitterness of confinement, but constitutes, under any circumstances, the greatest pleasure of civil existence. Nor is subtraction from punishment the only bad consequence of intercourse: it entirely and for ever prevents the return of the unhappy participators to an honorable course of life. As their infamy is notorious, efforts to reform require more courage and perseverance than generally fall to the lot of the tenants of our penitentiaries. Nor is it probable that in a place surrounded by profligacy so abandoned, depravity so confirmed and diversified, many attempts at reformation will be made, or many virtuous resolutions formed. The spark is extinguished before it warms, the plant is killed before it shows indications of a flower.

But association in prisons not only prevents the growth of virtue, but is productive of positive and lamentable evil. Prisons are moral lazar-houses, the repositories of the worst men in the community, whose assemblage must be attended with a shocking interchange of opinions and sentiments. The old offenders are conducted still deeper into the mysteries of iniquity —the young are initiated by competent instructors, who blight, as by a mildew, every germ of virtuous sensibility; and all are entertained with histories of former adventures, and anticipations of future exploits. Frightful would be the catalogue of outlaws, rendered so by their fellow prisoners, if all the instances were recorded. The path of moral aberration, experience shows, is not abrupt in its descent, but gently declivitous. If the unhappy wanderer be alone, he may be long in his downward journey, without advancing far in its intricacies; he may find it rough, solitary, surrounded by gloom, and wish to return;—but give him a companion who will entertain him by the way, who will teach him how to appreciate its delights, who will flatter him with the hope of escaping its dangers, and he goes on equal to all its asperities, and reckless of ruin, till at last he finds himself in a labyrinth from which he wants the will and the power of extrication. In the face of all these truths, whose reception is now become universal, is the Auburn system established, and its friends modestly ask of the world to invert the natural order of things, and eulogize their theory as one prolific of moral benefit.

I am aware it is urged that the prisoners, though together, are prevented from both oral and ocular intercourse. Ridiculous! To attempt to restrain the glances of vision, under any circumstances, is preposterous; but to control both the eyes and the tongue, under those at Auburn, is *absurd* and *impossible.* This language is not used without due reflection, for though the system be abominable, it has been the singular good fortune of the establishment to possess, as superintendents, men whose vigilance, alertness, and *rigour* are equal to what is not physically impossible, and they have been unable to prevent a full intercommunication of ideas, and the freest interchange of looks. It is entirely immaterial what the infatuated advocates of the system may allege, but it is a truth well ascertained, on unexceptionable authority, by the disclosures of the criminals themselves, that their minds are unburthened to each other with ease and freedom. Where, then, is the boasted superiority of Auburn—a superiority which, if it ever possessed over the old theory pursued in prisons, is not attributable to its own and intrinsic efficacy, but to the individuals who have happened to be intrusted with its management.

The regularity and order which, it is pretended, prevail in every department of the prison, are dwelt upon with peculiar earnestness and fervor. The general economy of the building, and the different employments of the prisoners, are recorded with minute precision—the hours of rising, refection, and retiring, noted as matters of infinite moment—even the night-tub, water-can, mush-kid, closed files, reigning silence, and turnkeys with woollen socks, are brought in with the utmost solemnity to swell the description. It must be amusing to observe the consummate address, the adroit dexterity, with which the prisoner learns to convey his meaning to his companions, in despite of the vigilance of the keepers, and the antic tricks which are occasionally played before their eyes. Little aid from fancy is required to conceive the suppressed merriment, the sportive behavior, and inclination to ridicule on the part of the wags of the fraternity, on the grave occasions of the prisoners forming in lines, marching out of their shops to take up their tubs, and in performing the other important ceremonies which the police of the prison enjoins. Many a laughable farce, no doubt, is carried on under the nose of the superintendent—laughable indeed to those engaged in the sport, and to an observant, unreflecting spectator—but solemn to the philanthropist, to the philosopher, to all who have the reformation of these unfortunate creatures, and the benefit of society, at heart. It will indeed be worthy of devout thankfulness, if the convicts should confine themselves to *comic* operations, and not, by the influence of those causes to which I have adverted, rise, by common consent upon their keepers, and commit a horrible *tragedy.*

But passing for a moment the peculiar demerits of its police regulation, it would be well for the legislature before they adopt the plan of Auburn, seriously to

inquire whether it is really an improvement on their old system of penitentiary discipline, or whether in fact Pennsylvania would not be receding by its admission. In Auburn the prisoners labor together every day, but are kept separate during the night; they are soundly, not to say *brutally*, castigated on the commission of a trivial misdemeanor, or infringement, in any respect, of the prison laws. The old system pursued in Pennsylvania, suffers the convicts to labor together, not every day, but occasionally: they are sometimes for long periods confined to the solitary cells, and flogging, under no circumstances, is permitted. Solitary confinement, with labor, as I shall hereafter demonstrate, has been in the view of Pennsylvania ever since the year 1787, and she has been prevented from carrying it into complete effect, long since, only by the want of suitable edifices. Though from this cause, the entire application of solitude has been obstructed, yet it was believed that a certain portion might be beneficial to counteract, if possible, the baleful consequences of intercourse. Ever since the year 1794, solitary confinement in Pennsylvania has formed a part of each convict's sentence, not simply during the night, according to the Auburn system, but in some instances, for months and years without interruption. In this respect, then, the adoption of Auburn would be a positive retrogression—a departure from long established principles—not to mention the re-introduction of whipping, as one of its appendages, which was abandoned, with becoming disgust, in 1795.

Such is the lauded discipline at Auburn. A theory by no means new, and in Europe meriting commendation because superior to the discipline in vogue; but defective, unnatural, and totally unfit for the government of men, no matter how depressed by misfortune, or degraded by crime. Let its advocates, who, it must be confessed, are pretty much *novi homines*, novices in penitentiary science, reflect upon the injuries they are inflicting, not only upon the state of Pennsylvania, but upon the cause of humanity and virtue, by their injudicious recommendation of it, in preference to a system, not the result of homage for foreign practices, but the effect of long observation, successive experiments, and a charitable but enlightened contemplation of the character of man, however varied by education, modified by accident, or obscured by obliquity, and of the native propensities, sentiments, affections, and capacities of the human heart. A PENNSYLVANIAN.

From the Philadelphia Gazette.

PROCEEDINGS OF COUNCILS,

Thursday, Sept. 6th, 1832.

SELECT COUNCIL.—A communication from the city commissioners and city clerk was received, and referred, in relation to accounts, and purchase of paving stones; also one from the city clerk submiting printed statements of his receipts for entries of hackney coaches, wagons, carts, drays, wheelbarrows, and handbarrows, and for permits for placing building materials during the last quarter, together with an account of his payments to the city treasurer for the same period.

The annexed communication from the city Treasurer was received, and referred to the committee of ways and means.

The Presidents of the Select and Common Councils.

Gentlemen—I beg leave to inform you that on the 8th ultimo I received from the executors of Stephen Girard the sum of nine thousand seven hundred and fifty dollars, which with two hundred and fifty dollars retained by them for the state tax of 2½ per cent under the collateral inheritance law, making together a total of ten thousand dollars, being the amount bequeathed by Mr. Girard to "the mayor, alderman and citizens of Philadelphia in trust safely to invest the same in some productive fund, and with the interest and dividends arising therefrom to purchase fuel for poor white house keepers and room keepers, &c."

That the sum first above mentioned has been placed to the credit of said fund and remains to be invested. Very respectfully, yours,

CORNELIUS STEVENSON,
City Treasurer.

City Treasurer's Office, Sept. 6, 1832.

A communication from Charles Johnson, Esq. was received, tendering his resignation as a member of Council, which was accepted.

The subjoined communication from the Sanitary Committee was received, and ordered to be printed

SANITARY BOARD, Aug. 19, 1832.

To the Presidents of the Select and Common Councils.

Gentlemen,—The inclosed communications from the medical committee of consultation, were received on the 27th and 29th insts, and the following resolution was this day adopted:

Resolved, That the communication received this day from the committee of consultation upon the subject of a permanent cholera hospital, with that received upon the 27th inst. upon the same subject, be presented to the Select and Common Councils, with a request that they take immediate order upon them. Very respectfully.

SAML. DAVIS,
Secr'y of the Sanitary Board.

SELECT COUNCIL CHAMBER, Aug. 29, 1832.

The committee of the Medical Council, charged with a reply to the resolution of the Sanitary Committee on the establishment of a permanent cholera hospital, report the following suggestions and recommendations as most suitable to the present state of this business.

1st. That an hospital or infirmary of forty beds be provided.

2d. That this infirmary be on a large and well ventilated lot, not far from the centre of the plot of the city.

3d. That if a building already erected, and thus circumstanced cannot be procured, and remodelled so as to make it fit for the purpose indicated; that a new one on a plain but substantial plan be erected without delay.

4th. That when the building itself, its size, and position shall be determined on by the proper authorities, your committee will be ready to report on the details of its interior arrangement, and on the plan of its operations.

The committee would further add, that from the size and location of the hospital recommended, it is obviously calculated only to meet the exigencies of the city under ordinary visitations from the cholera; and is an economical substitute for the present extensive plan of accommodation, and also a deposit for hospital furniture. But should this disease ever become very extensive, it will of course be expedient to establish temporary hospitals, which could be done according to the actual necessity of the occasion, from the stores of the permanent infirmary, one hospital after another being organized, according to the progress of the epidemic.

The preceding resolutions &c. were unanimously adopted, and a resolution passed that they be handed in to the Sanitary Committee.

JOHN C. OTTO, Chairman.
SAMUEL JACKSON, Sec'ry.

MR. PETTIT presented the following communication from the commissioners of Kensington District, which was referred to the watering committee.

To the Select and Common Councils of the city of Philadelphia.

Gentlemen:—On behalf and by the direction of the committee of Kensington District of the Northern Liberties, appointed by the commissioners thereof, on the subject of the introduction of the Schuylkill water into said district, it is my duty to state that since our former communication meetings have taken place between the watering committees of Councils, Northern Liberties, and Kensington, and we regret to say, that the results of those meetings are not so favourable to our district as

we had reason to anticipate. We were aware that the most direct, and perhaps the most economical mode of introducing the water into our district would be by a continuation of the main pipes, now laid through the whole extent of the district of the Northern Liberties, into Kensington. On an interchange of opinions with the committee of the Northern Liberties, we are apprehensive that this mode of introducing said water cannot be effected. The committee of the Northern Liberties require for the privilege of attaching to their pipes a *bonus of twelve thousand dollars*. This sum we are not authorized by our board to yield. By the contract between the city and the Northern Liberties, the city expressly reserved the right of contracting with any and all the neighbouring districts, for supplying them with said water. It is easily to be perceived that the city may be deprived of the benefit of this reservation, and the adjoining districts of the use of the water, if either of the districts now supplied should demand an exorbitant sum for the use of their pipes of conduit. The situation of Kensington is peculiar in this respect; it lies north and east from the Northern Liberties and Spring Garden, and should the Schuylkill water ever be introduced into this district; it must, in all probability, first pass through one or other of those districts. The committee of Kensington beg to state that their district is large, populous and increasing. The rents to arise from the use of the water would now be considerable, there being many extensive factories within its limits all or many of which would be benefitted by the introduction of the Schuylkill water, independently of the great number of private persons now desirous for its use. With these considerations they have concluded to offer the Northern Liberties the sum of six thousand dollars, that being the extent of their instructions, and respectfully ask from Councils their aid as to the balance of the sum required by the Northern Liberties.

Signed on behalf and by order of the Committee of Kensington. HUGH CLARK.

Chairman of Watering Committee.

Kensington, Sept. 1st, 1832.

Mr. Groves called up for consideration the report of the committee, relative to the Rail Road along Broad street, which was re-committed to the same committee, and Mr. Horn was substituted in the place of Mr. Johnson, resigned.

Mr. Duane called up for consideration the ordinance reported by the Girard committee, which after being amended, passed its first and second reading.

COMMON COUNCIL.—Mr. Baker, as chairman of the paving committee, made two reports and resolutions, in favor of paving Paper Alley from Juniper to Broad street, and Madison street, which were adopted by the Common Council, but were laid on the table in the Select Council.

Mr. Okie, as chairman of the committee of accounts, made the annexed report.

The committee of accounts report—that they have examined the accounts of the city treasurer for the quarter ending 30th June last, and compared the same with the proper vouchers and bank books, all of which they found to be correct.

The following communication from Messrs A. Russell and Co. was received, and referred to the Committee on the rents of Girard estate.

Philadelphia, Aug. 23d, 1832.

James Page, Esq. President of the Common Council of the city of Philadelphia.

Sir—In consequence of the great decline of trade and the necessary fall of rents generally, we who occupy the building No. 104 Chesnut street, beg leave to state that our present rent (say $1600 per annum) is greater than our business will warrant us in paying. We therefore request that you will lay the subject before Councils, earnestly entreating that they will adapt the said rent to the times, by having it reduced to what may be considered reasonable. Very respectfully, your obedient servant, AB. RUSSELL & CO.

Mr. Lehman offered the annexed resolution, which was adopled by both Councils.

Resolved, that the city commissioners be and they are hereby authorized to purchase two thousand dollars worth of paving stones, in addition to those already contracted for, and that the expense be charged to appropriation No. 19.

Mr. Horn offered the following resolutions, which were passed by the Common Council but were laid on the table in the Select Council, it being late when they were received.

Resolved, by the Select and Common Councils of the City of Philadelphia, That the Mayor be requested to draw his order on the city treasurer in favour of Doctors Samuel Jackson, Richard Harlan, and Charles Meigs, the three gentlemen composing the commission sent by the city to visit Canada on an investigation of the epidemic cholera, as a compensation for expenses and services in relation to said commission, for the sum of four hundred dollars to each commissioner and that the same be charged to appropriation No. 21.

Resolved, That the thanks of the citizens of Philadelphia be presented to the above named gentlemen for their worthy and patriotic zeal and promptitude in repairing at the call of the city to the scene of pestilence and danger to subserve the cause of humanity.

METEOROLOGICAL REGISTER.

Extract from the Meteorological Register, taken at the State Capitol—Harrisburg, Pennsylvania,

By James Wright, Librarian.

AUGUST, 1832.

Days of the Month.	Days of Week.	Morning temperat.	Noon temperature.	Even. temperature	Mean temp. of day	Highest in Morn.	Highest at Noon,	Highest in Even.	Mean height of Barometer each day	WINDS.
		Thermometer.				*Barometer.*				
1	Wednesd	68	76	77	74	29.53	56	54	29.54	S W
2	Thursd'y	69	77	75	74	52	55	54	54	N
3	Friday	65	80	80	75	50	54	56	53	S W
4	Saturday	70	80	75	75	51	51	50	51	N W
5	Sunday	71	75	72	73	46	48	47	47	S W
6	Monday	70	78	78	75	45	48	50	48	S E
7	Tuesday	74	80	81	78	46	47	47	47	S
8	Wednesd	73	76	73	74	44	45	43	44	W
9	Thursd'y	72	77	76	75	42	42	43	42	S
10	Friday	69	76	75	73	40	43	45	43	N W
11	Saturday	60	74	75	70	43	45	49	46	N W
12	Sunday	64	78	79	74	44	48	48	47	W
13	Monday	75	84	83	81	47	50	49	49	S W
14	Tuesday	74	86	83	81	47	48	50	48	S
15	Wednesd	76	85	84	82	48	48	50	49	S W
16	Thursd'y	76	84	74	78	46	45	44	45	N E
17	Friday	72	70	70	71	44	39	41	41	N E
18	Saturday	65	65	65	65	40	39	38	39	E
19	Sunday	68	75	72	72	37	40	38	38	S W
20	Monday	66	75	76	72	38	41	43	41	N W
21	Tuesday	68	78	76	74	38	40	41	40	W
22	Wednesd	70	72	75	72	38	38	38	38	S
23	Thursd'y	70	76	75	74	37	38	38	38	N W
24	Friday	66	77	74	72	38	40	41	40	N W
25	Saturday	57	66	67	63	37	39	42	39	N W
26	Sunday	57	66	70	64	38	40	47	42	N W
27	Monday	58	72	75	68	40	40	43	41	S E
28	Tuesday	65	60	70	65	40	40	40	40	S
29	Wednesd	68	74	76	73	40	40	42	41	S W
30	Thursd'y	67	79	76	74	38	39	40	39	S W
31	Friday	76	86	80	81	36	40	36	37	S W

Thermometer.		*Barometer.*	
Maximum on 15th	82°	Max. on the 1st	29.54 in
Minimum on 25th	63°	Min. on the 31st	29.37 in
Difference	19°	Difference	.17 in
Mean	73°	Mean	29.44 in

Days of the Month.		*Wind.*
2,	1 day	N
16, 17,	2 days	N E
18,	1 day	E
6, 27,	2 days	S E
7, 9, 14, 22, 28,	5 days	S
1, 3, 5, 13, 15, 19, 29, 30, 31,	9 days	S W
8, 12, 21,	3 days	W
4, 10, 11, 20, 23, 24, 25, 26,	8 days	N W

Atmosphere.

Days of the month.	*Morning.*	*Afternoon.*
3, 6, 10, 11, 12, 13, 14, 15, 20, 21, 23, 24, 25, 26, 29, 30,	16 days Fair	Fair
1, 27, 31,	3 days Fair	Cloudy
4, 5, 8, 16,	4 days Cloudy	Rain
7, 9,	2 days Cloudy	Cloudy
17, 22,	2 days Rain	Cloudy
2,	1 day Show'y	Show'y
18, 19, 28,	3 days Rain	Rain

On the 14th at noon, thermometer at 86° the highest. On the 25th in the morning, thermometer at 57° the lowest. Range 29°

On the 1st at noon, barometer at 29.56 inches the highest. On the 31st in the morning, at 29.36 inches the lowest. Range 00.20 inches.

The wind has been five days east of the meridian, 20 days west of it, one day north, and five days south.

There was rain on the 2d, 4th, 5th, 8th, 16th, 17th, 18th, 19th, 22d, and 28th. The heaviest, 4th, 5th, 8th, 16th, and 19th.

From the Cambria Democrat.

ALLEGHENY PORTAGE RAIL-ROAD.

The leading article of the Philadelphia Gazette, of August 1st, was a notice of the Allegheny Portage Rail-road, which, from the extensive circulation of that paper, has been copied into various journals throughout the state, and also in New York and Boston.

In that account the rails of the Portage Road are stated to be of cast iron, which is incorrect. They are to be of rolled iron, in lengths of fifteen feet. They will weigh forty pounds per yard; and resemble, in their general form, those used on the Preston and Wigan Railway, in England, which are stronger, and less liable to be displaced, than the rails of the Liverpool and Manchester Road. The stone blocks contain 3½ cubic feet each, weighing about a quarter of a ton. They are placed three feet from centre to centre, surrounded by broken stone, and the cast iron chairs which support the rails are firmly spiked to them. Contracts have been made for furnishing the rails and chairs, and for laying a single tract of railway, with the necessary turn-outs, throughout the line from Hollidaysburgh to Johnstown, a distance of thirty-six miles and two-thirds.

The graded bed of the rail-road is 25 feet wide, with appropriate side ditches and drains. A considerable part of the grading is done, and a force of about two thousand men is now employed upon the line.

The ascent on the eastern side of the mountain is 1,399 feet, and the descent on the western side 1,172 feet. There are five inclined planes on each side, varying in length from 1,500 to 3,100 feet. They are all straight, and their inclination with the horizon is between four and six degrees.

The Allegheny Portage Rail-road connects with the Juniata Canal, at the town of Hollidaysburgh, in Huntingdon county; and passes up the narrow valley of Black Gap Run, ten miles, to the summit of the mountain at Blair's Gap; which is passed by a cut twelve feet deep. The line then runs along the western slope of the mountain to the head of Conemaugh, and follows the valley of that stream to the borough of Conemaugh, commonly called Johnstown, in Cambria county, where the rail-road ends, and the western division of the Pennsylvania Canal commences. This canal is now navigable throughout the whole course to the city of Pittsburgh.

The most prominent works on the line of the rail-road are the following: A stone viaduct over one branch of the Juniata, at Hollidaysburgh, which has two eliptical arches of 40 feet 4 inches span. As the line crosses the stream obliquely, the arches are skewed, so as to vary 35 degrees from right angles with their abutments; these arches are being built of cut stone, the beds of which are warped surfaces.

The scenery in the vicinity of the great viaduct over the Little Conemaugh river, is of singularly wild and striking description. The river forms a loop, about two miles in extent, around the base of a mountain, returning almost to the place of beginning; at this point there is a very narrow gap in the dividing ridge through which the rail-road passes. In running this distance the river falls about forty-five feet, and, as the rail-road cuts off the bend, a viaduct seventy feet high, above the water, becomes necessary. This is now being built of sand stone, in the most substantial manner, with a semi-circular arch of eighty feet span.

The tunnel, through a spur of a mountain four and a half miles from Johnstown, will be 880 feet long, through rock, and will save about two miles in distance.

When finished, it will be twenty feet wide and nineteen feet high in the middle:—it is now cut larger, in order to admit of an arch; and about one half of the excavation of the tunnel is now done.

As the Portage Rail-road will form an important part of the main line of Pennsylvania state improvements, it has been deemed advisable to make it in the best and most permanent manner. The country, through which much of it passes, is extremely wild and ragged, rendering expensive cuttings and embankments necessary; and all the drains, culverts, and bridges are of stone.

Stationary steam power is intended to be used at the Inclined Planes, and either horses or locomotive engines on the other parts of the road. The road is expected to be open for travelling next summer, with a double track upon the planes and at the turn-outs, and with a single track for the rest of the distance; the remainder of the double track can be afterwards advantageously laid.

When this road is open, there will be a complete and direct channel of communication by canal and railway, from the city of Philadelphia, through the state of Pennsylvania, to the city of Pittsburgh, at the head of the Ohio, the great highway of the west; and, in a short time afterwards, politicians will not think it their interest to dispute such an investment of the funds of the commonwealth. S.

GEOLOGICAL SURVEY.

A brief notice of the first part of a report of a geological survey of Massachusetts, by Edward Hitchcock, A. M. professor of chemistry and natural history, in Amhurst College. By Peter A. Browne, of Philadelphia.

(Written for the Bucks County Intelligencer.)

The above publication has recently made its appearance amongst us. The learned gentleman to whom we are indebted for the pleasure of its perusal, proposes to divide his labors into four parts. The first and the only one which has yet been published, purports to embrace

the *economical* geology of the state, or an account of the rocks, soils, and minerals that may be applied to useful purposes, and thus become sources of pecuniary profit; and so far as I am able to judge of it, without having had lately the advantage of passing over the ground, it is executed, generally, in a manner highly creditable to its author. The second is to embrace the *Topographical* geology. The third part is to consist of the *Scientific* geology, and the fourth part will embrace catalogues of the native mineralogical, botanical, and zoological productions of that commonwealth. should the remaining parts be executed with equal care and ability, the whole report will present a valuable addition to the American Library, which should find its way to our seminaries of learning, and which ought to be placed in the hands of the rising generation of both sexes. Some may perhaps suppose that, as Pennsylvanians, this work will be no further interesting to us than the pleasure we take in contemplating the increasing prosperity of a sister state; but when we consider that the rocks of this continent form a general, though not a continuous line of formations, crossing the United States in a direction nearly from north-east to south-west, the study of the geology of Massachusetts assumes an importance not at first anticipated, and invites our study in a degree we had not originally imagined.

The survey, it seems, was made under the authority of the legislature, and is to be accompanied by a geological map of the state, which we are informed is now in progress, and a collection of specimens of every variety of rock found in the commonwealth, which are to be placed at the disposal of that body. This is an example which would be highly creditable to the representatives of Pennsylvania.

Professor Hitchcock commences his report with a brief notice of the soils, in doing which he has adopted and explained the distinction made by Messrs. Conybeare & Philips, between *allurium* and *diluvium*, which, in the United States as well as in Europe, is a very obvious one. Of the former valuable soil, Massachusetts has a much less proportion than our state and the state of New York. The principal part, as will be seen by casting the eye over the preliminary map which accompanies the report, lies along the Connecticut river. This appears very inconsiderable when compared with the fine alluvials, or "river bottom lands" as these are sometimes called of the Delaware, the Schuylkill, the Susquehannah, the Alleghany, and the neighborhood of Lake Erie. We look also in vain to Massachusetts for those extensive limestone districts that render so estimable the farms of Whitemarsh, in Montgomery, Lancaster, Cumberland, Franklin, and other counties in Pennsylvania. Nevertheless, Massachusetts is by no means deficient in soils.—The new red sand stone, says our reporter, though not equal in fertility to that of its corresponding rock in England is of a "superior quality." It is peculiarly adapted to fruit, and the grass grown upon it is excellent. In the western part of Worcester county the ground, for a width of several miles, is highly impregnated with oxide of iron, and there is no doubt but that the presence of this ingredient has a beneficial influence upon the soil. The magnesian rocks are in Massachusetts of very limited extent. The soils derived from these rocks are, in Europe, generally considered of an inferior quality, but for the proof that in the hands of good farmers they can be made exceedingly productive, we refer with confidence and with no small degree of pleasurable feeling to the fine farms of the county of Chester in this state. Time will not permit us, whatever may be our inclination, to dilate upon the other soils noticed in the report.

If Massachusetts cannot compete with some other states of the Union in the richness of her soils, she can vie with them in the variety and beauty of her granites, her sienites, her porphyries, and her serpentines. Mr. Hitchcock mentions that most of the rock that is *there* generally described as sienite is a variety of granite; whereas *here* nearly all the sienites are called granite. This confusion in names should be avoided as much as possible. But I cannot agree with him that wherever the granite admits of hornblende into its composition, that it should be called "sienite;" that would lead to much greater difficulty. We have no granite in the neighborhood of Philadelphia, except in veins of gneiss of Micaceous Schistus, or in boulders found in the diluvium; but we have the most beautiful and durable sienite, which will answer every purpose of the eastern granite. and in the talcose formation, a short distance south of the Paoli, in Chester county, the preparations for making the Columbia rail-road, have displayed a quarry of serpentine that promises to be very useful and ornamental to Philadelphia.

Our author remarks that in regard of hornblende slate he does not recollect to have seen it employed in Massachusetts for any useful purpose, except for the construction of common stone walls. Near the Schuylkill, at a distance of 7 or 8 miles from our city, is a quarry of hornblende slate, which is equal to any perhaps in the world. The rocks which lay at an angle of about 45° may be readily split in the direction of their natural joints, in slabs of almost any length and width that can be managed by the workmen, and with perfectly even and smooth surfaces.

Anthracite and bituminous coal are also quoted, but whether they occur in sufficient quantities, and of such quality, as to render them of any statistical value, is made a question. In speaking of the former combustible, our author has, as I conceive, inadvertently fallen into an error of the other hemisphere, where they know very little about anthracite, in saying that it is "sometimes found in the *primitive* rocks." He has certainly spoken unadvisedly when he asserts that it is so found in *this country*. His facts are at variance with the assertion. "We have," he says, "in the United States, at least three extensive deposites of anthracite: the largest in Pennsylvania; the next largest in Rhode Island; and the smallest in Worcester, Mass." "I have examined them all, and have come to the conclusion, that *all* the rocks containing this coal, are *at least as low down in the series as the* TRANSITION *class.*" But what authority is this for placing them *still lower down* in the *primitive?* In what immediately follows, the professor is uncommonly obscure and contradictory, for after having asserted that he had "examined them all," and that "ALL the rocks containing this coal are *at least as low down in the series as the transition class,*" he adds, "I suspect that the Pennsylvania anthracite occurs in the *higher beds of the grauwacke'*, perhaps even in the *mill-stone grit:*" thus, so far from tracing the anthracite to the *primitive*, placing it in the higher ranks of the *transition*, or even in the *secondary*. Baron Humboldt, whose opinions Professor Hitchcock, in page 46, justly quotes with confidence, gives no countenance to the opinion, that anthracite belongs to the primitive rocks, but on the contrary considers graphite or carburet of iron, which is found in the primitive rocks, as a more *ancient formation.**

Massachusetts appears to be very rich in iron; among the great variety of ores, the argillaceous oxide is the most abundant and most extensively used. Lead, copper, zinc, and manganese have been discovered in various places.

In the talcose slate formation in the state of Vermont, gold has been found, and there is nothing improbable in the expectation of finding that precious metal in the same formation in Massachusetts, as Professor Hitchcock remarks.

Upon the whole I am persuaded that this report will amply repay the trouble of a perusal.

* In Bucks county, Pa. carburet of iron is found abundantly in primitive lime rock, the last of the primitive series.

CHOLERA RECORD.

SUMMARY REPORT.

Date	Private practice. New cases.	Private practice. Deaths.	Hospitals. New cases.	Hospitals. Deaths.	Almshouse. New cases.	Almshouse. Deaths.	Arch Street Prison. New cases.	Arch Street Prison. Deaths.	Total. New cases.	Total. Deaths.
July 11	1	1	0	0	0	0	0	0	1	1
16	5	3	0	0	0	0	0	0	5	3
17	1	0	0	0	0	0	0	0	1	0
18	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0
24	1	1	0	0	0	0	0	0	1	1
25	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0
27	0	0	2	2	0	0	0	0	2	2
28	1	1	5	4	0	0	0	0	6	5
29	4	0	1	0	1	1	0	0	6	1
30	9	3	5	3	0	0	1	1	15	7
31	5	2	9	5	5	2	0	0	19	9
Aug. 1	16	5	4	2	1	1	0	0	21	8
2	8	3	14	9	5	2	13	1	40	15
3	13	4	13	5	5	1	4	4	35	14
4	27	4	9	8	0	0	9	1	45	13
5	26	10	28	10	11	6	*	*	165	26
6	29	10	86	24	16	11	45	26	176	71
7	78	26	38	32	17	8	3	7	136	73
8	43	7	35	20	35	18	1	1	114	46
9	94	26	35	24	24	7	1	1	154	58
10	83	12	45	21	14	4	0	1	142†	39
11	76	14	41	§13	8	3	‖1	3	126	33
12	66	12	‡39	15	5	4	0	0	110	31
13	94	24	28	18	8	7	0	0	130	49
14	70	12	33	17	5	8	3	0	111	37
15	36	6	32	14	4	3	1	0	73	23
16	62	14	**31	15	1	1	0	0	94	30
17	49	11	36	13	0	1	0	0	††90	26
18	53	11	21	7	0	0	0	0	74	18
19	20	5	25	6	4	0	0	0	49	11
20	31	7	22	9	1	0	0	0	54	18
21	27	4	24	3	0	0	0	0	51	9
22	20	4	26	4	2	1	0	0	49	9
23	11	4	20	6	0	2	0	0	33	10
24	21	4	26	5	1	1	0	0	48	10
25	16	5	7	5	1	0	0	0	24	10
26	7	1	23	5	0	0	0	0	30	6
27	5	1	16	6	0	0	0	0	21	7
28	5	0	11	2	0	0	0	0	16	2
29	7	2	13	2	0	0	0	0	20	4
30	8	2	12	1	0	0	0	0	20	3
31	10	3	13	2	0	0	0	0	23	5
Sept. 1	5	2	13	1	0	0	0	0	18	3
2	1	0	4	0	0	0	1	0	6	0
3	6	2	5	1	0	0	0	0	11	3
4	5	1	7	0	0	0	0	0	12	1
5	4	0	3	1	0	0	0	0	7	1
6	6	1	5	0	0	0	0	0	11	1
7	1	0	1	0	0	0	0	0	2	0
8	2	0	0	0	0	0	0	0	2	0
9	0	0	0	0	0	0	0	0	0	0
10	2	0	2	0	0	0	0	0	4	0
11	3	0	1	2	0	0	0	0	4	2
12	2	0	4	0	0	0	0	0	6	0
13	0	0	1	0	0	0	0	0	1	0
Total..	1175	270	874	342	174	92	86	46	2314	754

* No report.

† Including four cases and one death in Pennsylvania Hospital.

‡ One case, and one death in Walnut Street Prison.

§ One death in Pennsylvania Hospital.

‖ One case do do

** One case do do

†† Including 5 new cas. & 1 d. at the marine barracks.

TABLE SHOWING WHERE THE CASES OF PRIVATE PRACTICE OCCURRED.

Date.	Kens.	N. L.	P. T.	City.	South.	Moya.	West Phila.	Total.
July 11	0	0	0	1	0	0	0	1
16	0	4	0	0	1	0	0	5
17	0	0	0	0	1	0	0	1
24	1	0	0	0	0	0	0	1
27	0	0	0	0	1	0	0	1
28	0	0	0	0	1	0	0	1
29	0	1	0	2	0	1	0	4
30	2	3	0	0	0	3	0	8
31	0	4	0	0	0	1	0	5
Aug. 1	3	3	0	2	3	5	0	16
2	0	4	0	1	1	2	0	8
3	4	2	0	2	2	2	1	13
4	9	8	1	6	3	0	0	27
5	6	7	0	7	4	2	0	26
6	2	5	1	11	3	7	0	29
7	4	15	1	37	7	14	0	78
8	2	9	4	17	2	9	0	43
9	6	9	2	34	24	19	0	94
10	4	5	1	32	25	16	0	83
11	3	10	2	29	16	15	0	76*
12	7	5	3	27	12	13	0	66
13	8	8	4	29	24	21	0	94
14	8	4	5	22	19	9	2	70*
15	4	0	6	13	7	5	1	36
16	5	6	0	24	17	10	0	62
17	0	2	6	24	9	7	0	49†
18	1	3	2	24	13	9	1	53
19	3	3	1	6	4	3	0	20
20	6	3	1	9	10	1	1	31
21	1	4	0	11	4	7	0	27
22	1	3	1	9	3	3	0	20
23	1	2	0	3	3	2	0‡	11
24	6	4	1	6	3	1	0	21
25	3	0	0	3	8	2	0	16
26	3	0	1	1	1	1	0	7
27	1	0	0	1	3	0	0	5
28	0	0	1	0	4	0	0	5
29	0	0	3	2	0	2	0	7
30	2	1	3	1	0	2	0	8
31	1	1	1	3	3	1	0	10
Sept. 1	1	3	0	1	0	0	0	5
2	1	0	0	0	0	0	0	1
3	0	0	2	1	2	1	0	6
4	0	0	0	0	3	2	0	5
5	0	2	0	2	0	0	0	4
6	0	0	0	3	3	0	0	6
7	0	0	1	0	0	0	0	1
8	1	0	1	0	0	0	0	2
9	0	0	0	0	0	0	0	0
10	0	1	1	0	0	0	0	2
11	1	0	0	0	2	0	0	3
12	0	0	0	1	0	1	0	2
13	0	0	0	0	0	0	0	0
Total..	111	144	55	407	251	198	6	1175

* Including one case in Passyunk.

† Residence of one case not given.

‡ Two cases in Passyunk.